

CLAIMS

1. A manufacturing method of a thin-film magnetic head with a magnetoresistive effect element comprising the steps of:

forming a plurality of magnetoresistive effect elements on a wafer;

forming a plurality of pairs of connection pads, each pair of connection pads being electrically connected across each magnetoresistive effect element;

forming a plurality of thin-film short-circuit patterns on a surface of said wafer, each short-circuit electrically short-circuiting between each pair of connection pads; and

thereafter breaking each short-circuit pattern by laser radiation during a predetermined manufacturing process of the magnetic head.

2. The manufacturing method as claimed in claim 1, wherein said method further comprises a step of cutting said wafer into a plurality of bar members so that the plurality of magnetoresistive effect elements are aligned on each bar member, and wherein said predetermined manufacturing process is a process performed with respect to the bar member.

3. The manufacturing method as claimed in claim 1, wherein said method further comprises a step of cutting said wafer

into a plurality of bar members so that the plurality of magnetoresistive effect elements are aligned on each bar member, and a step of cutting and separating each bar member into a plurality of individual magnetic head sliders, and wherein said predetermined manufacturing process is a process performed with respect to the individual magnetic head slider.

4. The manufacturing method as claimed in claim 1, wherein each short-circuit pattern has a strip shape linearly connecting each pair of connection pads.

5. The manufacturing method as claimed in claim 1, wherein the short-circuit pattern forming step includes sputtering or depositing a good conductor layer, and etching the good conductor layer.

6. The manufacturing method as claimed in claim 5, wherein said good conductor layer is a gold, aluminum or platinum layer.

7. The manufacturing method as claimed in claim 1, wherein each short-circuit pattern has a thickness of 0.1-10  $\mu\text{m}$ .

8. A manufacturing method of a head gimbal assembly with a thin-film magnetic head provided with a magnetoresistive

effect element comprising the steps of:

forming a plurality of magnetoresistive effect elements on a wafer;

forming a plurality of pairs of connection pads, each pair of connection pads being electrically connected across each magnetoresistive effect element;

forming a plurality of thin-film short-circuit patterns on a surface of said wafer, each short-circuit electrically short-circuiting between each pair of connection pads; and

thereafter breaking each short-circuit pattern by laser radiation during a predetermined manufacturing process of the magnetic head.

9. The manufacturing method as claimed in claim 8, wherein said method further comprises a step of cutting said wafer into a plurality of bar members so that the plurality of magnetoresistive effect elements are aligned on each bar member, and wherein said predetermined manufacturing process is a process performed with respect to the bar member.

10. The manufacturing method as claimed in claim 8, wherein said method further comprises a step of cutting said wafer into a plurality of bar members so that the plurality of magnetoresistive effect elements are aligned on each bar member, and a step of cutting and separating each bar member

into a plurality of individual magnetic head sliders, and wherein said predetermined manufacturing process is a process performed with respect to the individual magnetic head slider.

11. The manufacturing method as claimed in claim 8, wherein said method further comprises a step of cutting said wafer into a plurality of bar members so that the plurality of magnetoresistive effect elements are aligned on each bar member, a step of cutting and separating each bar member into a plurality of individual magnetic head sliders and a step of assembling each individual magnetic head slider with a support member to form the head gimbal assembly, and wherein said predetermined manufacturing process is a process performed with respect to the head gimbal assembly.

12. The manufacturing method as claimed in claim 8, wherein each short-circuit pattern has a strip shape linearly connecting each pair of connection pads.

13. The manufacturing method as claimed in claim 8, wherein the short-circuit pattern forming step includes sputtering or depositing a good conductor layer, and etching the good conductor layer.

14. The manufacturing method as claimed in claim 13,

wherein said good conductor layer is a gold, aluminum or platinum layer.

15. The manufacturing method as claimed in claim 8, wherein each short-circuit pattern has a thickness of 0.1-10  $\mu\text{m}$ .